

**ABSTRACT OF THE DISCLOSURE**

Interband tunnel diodes which are compatible with Si-based processes such as, but not limited to, CMOS and SiGe HBT fabrication. Interband tunnel diodes are disclosed (i) with spacer layers surrounding a tunnel barrier; (ii) with a quantum well adjacent to, but not necessarily in contact with, one of the injectors, and (iii) with a first quantum well adjacent to, but not necessarily in contact with, the bottom injector and a second quantum well adjacent to, but not necessarily in contact with, the top injector. Process parameters include temperature process for growth, deposition or conversion of the tunnel diode and subsequent thermal cycling which to improve device benchmarks such as peak current density and the peak-to-valley current ratio.

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